

Claim Rejections Under 35 USC §112

Claims 11-17 are rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Claim 11 has been amended to correct the informalities and to alleviate the Examiner's rejections. A reconsideration for allowance of claim 11 is respectfully requested of the Examiner.

Claim Rejections Under 35 USC §102

Claims 1-2 and 4-16 are rejected under 35 USC §102(e) as being anticipated by Huang et al '750. It is contended that Huang et al discloses a matrix form semiconductor package substrate that has an electrode situated in-between a plurality of integrated circuit package substrates for providing electrical communication to conductive pads situated on the substrate. It is alleged that Huang et al teaches an electrode formed in a serpentine configuration along the boundary for providing electrical communication to the multiplicity of conductive pads.

The rejection of claims 1-2 and 4-16 under 35 USC §102(e) based on Huang et al is respectfully traversed.

Claim 1, in its newly amended form, recites:

"an electrode formed in a **rectangular-shaped**, serpentine configuration along said boundary for providing electrical communication to said multiplicity of conductive pads and for providing insulation between said multiplicity of conductive pads after said plurality of IC packages are cut along said boundary through said electrode."

The Applicants respectfully submit that, by examining Figure 3 of Huang et al, the electrode of Huang et al formed by 320,322, and 321 is clearly a triangular-shaped electrode along the boundary of two IC packages. Huang et al does not teach an electrode that is formed in a rectangular-shaped, serpentine configuration.

The rejection of claims 1-2 and 4-16 under 35 USC §102(e) based on Huang et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 1-2, 4-13 and 15-18 are rejected under 35 USC §102(e) as being anticipated by Chiu et al '678. It is contended that Chiu et al discloses a matrix form semiconductor package substrate that has an electrode situated in-between a plurality of integrated circuit package substrates for providing electrical communication to conductive pads situated on the substrate including an electrode that is formed in a serpentine configuration along the boundary.

The rejection of claims 1-2, 4-13 and 15-18 under 35 USC §102(e) based on Chiu et al is respectfully traversed.

Chiu et al discloses a wrap-around interconnect for fine pitch ball grid array including a multiplicity of cylindrical vias 62 that are positioned along cutting lines 46a,46b. After separation, a substrate 42 that has semi-circular vias 62 that have

openings 64 created by separating through the cylindrical vias 62 that are positioned along the cutting lines is produced, as shown by Chiu et al in Figures 3, 4 and 5. The Applicants respectfully submit that before separation, as claimed by the present invention independent claims 1 and 11, the alleged electrode of Chiu et al is a multiplicity of interconnect vias of cylindrical shape (see Abstract), and cannot be taken as an electrode formed in a serpentine configuration, let alone an electrode formed in a rectangular-shaped, serpentine configuration.

The rejection of claims 1-2, 4-13 and 15-18 under 35 USC §102(e) based on Chiu et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claim Rejections Under 35 USC §103

Claims 3 and 17-18 are rejected under 35 USC §103(a) as being unpatentable over Huang et al '750. It is contended that while Huang et al does not disclose the material of the plating bus, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the plating bus of Huang et al

with the material claimed by the Applicants. It is further contended that while Huang et al does not teach the exact amplitude of the serpentine configuration, such amplitude differences are considered obvious design choices and optimization by one skilled in the art would be considered as obvious.

The rejection of claims 3 and 17-18 under 35 USC §103(a) based on Huang et al is respectfully traversed.

As previously presented, the Applicants respectfully submit that independent claims 1 and 11, in their newly amended form, clearly and narrowly recites an electrode that is formed in a rectangular-shaped, serpentine configuration which Applicants have clearly shown is not taught, disclosed or suggested by Huang et al.

The rejection of claims 3 and 17-18 under 35 USC §103(a) based on Huang et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 3 and 14 are rejected under 35 USC §103(a) as being unpatentable over Chiu et al '678. It is contended that while Chiu et al does not disclose the material of the electrode, it would have been obvious to one of ordinary skill in the art to form the electrode or the plating bus of Chiu et al's by the same material as claimed by the Applicants.

The rejection of claims 3 and 14 under 35 USC §103(a) based on Chiu et al is respectfully traversed.

In the newly amended independent claims 1 and 11, the electrode of the present invention is clearly recited as "an electrode formed in a rectangular-shaped, serpentine configuration" which is clearly not taught, disclosed or suggested by Chiu et al.


The rejection of claims 3 and 14 under 35 USC §103(a) based on Chiu et al is respectfully traversed.. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Based on the foregoing, the Applicants respectfully submit that all of the pending claims, i.e. claims 1-17, are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version With Markings To Show Changes Made".

In the event that the present invention is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Claims

Claim 1 has been amended as follows:

1. (Amended) A matrix form semiconductor package substrate having an electrode situated in-between a plurality of integrated circuit (IC) package substrates for providing electrical communication to conductive pads situated on the substrate comprising:

a plurality of IC package substrates integrally formed on a substrate strip in a matrix form having a boundary between each two of said plurality of IC package substrates, each of said plurality of IC package substrates having a multiplicity of conductive pads; and

an electrode formed in a rectangular-shaped, serpentine configuration along said boundary for providing electrical communication to said multiplicity of conductive pads and for providing insulation between said multiplicity of conductive pads after said plurality of IC packages are cut along said boundary through said electrode.

Claim 11 has been amended as follows:

11. (Amended) A ball grid array package substrate comprising:

an insulating substrate having a top surface;

a plurality of BGA package substrates formed on said top surface of said insulating substrate;

a multiplicity of conductive traces emanating from each one of said plurality of BGA package substrates, each of said multiplicity of conductive traces provides electrical communication between a conductive pad and a wirebond finger situated on a BGA package; and

an electrode having a rectangular-shaped, serpentine configuration electrically connected to said multiplicity of conductive traces.